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Generalized Pre-Connectedness in Quadripartitioned Single Valued Neutrosophic Refined Topological Spaces

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Abstract:-In this paper, we introduce the notion of quadripartitioned single valued neutrosophic refined C_5 connected (QNRC_5 connected)space , quadripartitioned single valued neutrosophic refined generalized pre connected (QNRGP-connected) space. We investigate some of characterizations of connectedness in these spaces.

***Keywords**: Quadripartitioned single valued neutrosophic refined topology,quadripartitioned single valued neutrosophic refined C_5 connected space,quadripartitioned single valued neutrosophic refined generalized pre connected space.*

1. Introduction

In 1965, Zadeh[16] proposed the fuzzy set. In 1986, K. Atanassov[1] introduced the intuitionistic fuzzy set, a generalization of fuzzy sets. Neurothosophic sets, which are an extension of intuitionistic fuzzy sets and fuzzy sets, were proposed by Smarandache[10]. The uncertainty factor is dealt with in neutrosophic set theory. Single-valued neutrosphic sets, which are a generalization of intuitionistic fuzzy sets, fuzzy sets, and the classic set, were proposed by Wang [12]. Chatterjee introduced quadripartitioned single valued neutrosophic sets with four components: truth, contradiction, unknown, and falsity membership function. Broumi and others looked into some of the fundamental properties of several similarity measures. Between interval neutrosophic sets, Ye [13] presented the Hamming, Euclidean distance, and similarity measures. J.Ye [14] provided the generalized weighted distance and similarity measures between neutrosophic sets. In addition, the same author applied the Jaccard, Dice, and cosine similarity measures for SVNS to multicriteria decisionmaking problems using simplified neutrosophic information and proposed three vector similarity measures for simplified neutrosophic sets (SNSs). As a result, S.Broumi et al. [4] included interval neutrosophic sets in the generalized weighted distance between neutrosophic sets (NS). Hanafy and co. [7,8] presented the neutrosophic sets' correlation measure. Neutosophic refined sets were proposed by Deli et al.[6] as an extension of intuitionistic fuzzy multisets and fuzzy multisets..This paper is arranged in the following manner.In section 2 the basic concepts of quadripartitioned single valued neutrosophic refined sets, In section 3 we introduce quadripartitioned single valued neutrosophic refined C_5 connected (QNRC_5 connected)space , quadripartitioned single valued neutrosophic refined generalized pre connected (QNRGP-connected) space and their charcterizations.

2. Preliminaries

Definition 2.1 *[2] A QSVNRS ϱ on Λ can be defined by* $\varrho=\{\langle\kappa, T_\varrho^J(\kappa), D_\varrho^J(\kappa), Y_\varrho^J(\kappa), F_\varrho^J(\kappa)\rangle : \kappa \in \Lambda\}$ where $T_\varrho^J(\kappa), D_\varrho^J(\kappa), Y_\varrho^J(\kappa), F_\varrho^J(\kappa):\Lambda \to [0,1]$ such that $0 \leq T_\varrho^J + D_\varrho^J + Y_\varrho^J + F_\varrho^J \leq 4$ (J=1,2,...P) and for every $\kappa \in \Lambda$. $T_\varrho^J(\kappa), D_\varrho^J(\kappa), Y_\varrho^J(\kappa)$ and $F_\varrho^J(\kappa)$ are the truth membership sequence,a contradiction membership sequence,an unknown membership sequence and falsity membership sequence of the element x respectively. P is also referred to as the QSVNRS(ϱ) dimension.

Definition 2.2 *[2] Let ϱ, $\zeta \in$ QSVNRS(Λ) havimg the form*

ϱ ={⟨κ,$T_\varrho^J(\kappa), D_\varrho^J(\kappa), Y_\varrho^J(\kappa), F_\varrho^J(\kappa)$⟩:$\kappa \in \Lambda$} (J=1,2,...P)

ζ ={⟨κ,$T_\zeta^J(\kappa), D_\zeta^J(\kappa), Y_\zeta^J(\kappa), F_\zeta^J(\kappa)$⟩:$\kappa \in \Lambda$} (J=1,2,...P).Then

1. $\varrho \mathrel{\tilde{\subseteq}} \zeta$ if $T_\varrho^J(\kappa) \leq T_\zeta^J(\kappa)$, $D_\varrho^J(\kappa) \leq D_\zeta^J(\kappa)$, $Y_\varrho^J(\kappa) \leq Y_\zeta^J(\kappa)$ and $F_\varrho^J(\kappa) \leq F_\zeta^J(\kappa)$ (J=1,2,...P)

2. $\varrho^{\tilde{c}}$ ={⟨κ,$F_\varrho^J(\kappa), Y_\varrho^J(\kappa), D_\varrho^J(\kappa), T_\varrho^J(\kappa)$⟩:$\kappa \in \Lambda$} (J=1,2,...P)

3.$\varrho \mathbin{\tilde{\cup}} \zeta = \omega_1$ and is defined by

$T_{\omega_1}^J(\kappa)$=max{$T_\varrho^J(\kappa)$,$T_\zeta^J(\kappa)$},$D_{\omega_1}^J(\kappa)$=max{$D_\varrho^J(\kappa)$,$D_\zeta^J(\kappa)$},$Y_{\omega_1}^J(\kappa)$=min{$Y_\varrho^J(\kappa)$,$Y_\zeta^J(\kappa)$},

$F_{\omega_1}^J(\kappa)$=min{$F_\varrho^J(\kappa)$,$F_\zeta^J(\kappa)$} for all $\kappa \in \Lambda$ and J=1,2...P.

4. $\varrho \mathbin{\tilde{\cap}} \zeta = \omega_1$ and is defined by

$T_{\omega_1}^J(\kappa)$=min{$T_\varrho^J(\kappa)$,$T_\zeta^J(\kappa)$},$D_{\omega_1}^J(\kappa)$=min{$D_\varrho^J(\kappa)$,$D_\zeta^J(\kappa)$},$Y_{\omega_1}^J(\kappa)$=max{$Y_\varrho^J(\kappa)$,$Y_\zeta^J(\kappa)$},
$F_{\omega_1}^J(\kappa)$=max{$F_\varrho^J(\kappa)$,$F_\zeta^J(\kappa)$} for all $\kappa \in \Lambda$ and J=1,2...P.

Definition 2.3 *[2] A QSVNRTS on Λ^* in a family $\mathfrak{T}$ of QSVNRS in Λ^* which satisfy the following axioms.*

1. $\tilde{\Phi}_{QNR}$, $\tilde{\mathbb{X}}_{QNR} \in \mathfrak{T}$.

2. $H_1 \mathbin{\tilde{\cap}} H_2 \in \mathfrak{T}$ for any H_1, $H_2 \in \mathfrak{T}$.

3. $\tilde{\cup}\, H_i \in \mathfrak{T}$ for every{ H_i : i ∈ I}$\mathrel{\tilde{\subseteq}} \mathfrak{T}$.

Here the pair (Λ^*,$\mathfrak{T}$) is called a QSVNRTS and any QSVNRS in $\mathfrak{T}$ is said to be quadripartitioned single valued neutrosophic refined open set (QNROS) in Λ^*. The complement of $\varrho^{\tilde{c}}$ of a QNROS ϱ in a QSVNRTS (Λ^*,$\mathfrak{T}$) is known as quadripartitioned single valued neutrosophic refined closed set (QNRCS) in Λ^*.

Definition 2.4 *[2] Let (Λ^*,$\mathfrak{T}$) be a QSVNRTS and ϱ ={⟨κ,$T_\varrho^J(\kappa), D_\varrho^J(\kappa), Y_\varrho^J(\kappa), F_\varrho^J(\kappa)$⟩:$\kappa \in \Lambda^*$} for J=1,2,...P be QSVNRS in X.Then quadripartitioned single valued neutrosophic refined pre closure (QNRP($\mathfrak{cl}(\varrho)$) and quadripartitioned single valued neutrosophic refined pre interior (QNRP$\mathfrak{int}(\varrho)$) are defined by*

QNRP$\mathfrak{cl}(\varrho)$ = $\tilde{\cap}${K:K is a QNRPCS in $\mathbb{X}$ and $\varrho \mathrel{\tilde{\subseteq}}$ K}

QNRP$\mathfrak{int}(\varrho)$= $\tilde{\cup}${L:L is a QNRPOS in $\mathbb{X}$ and L $\mathrel{\tilde{\subseteq}} \varrho$}

Definition 2.5 *[2] Let (Λ^*,$\mathfrak{T}$) be a QSVNRTS is known asbQuadripartitioned single valued neutrosophic refined pre-closed set(QNRPCS) if QNRcl(QNRint(ϱ)) $\mathrel{\tilde{\subseteq}} \varrho$.*

Definition 2.6 *[2] Let (Λ^*,$\mathfrak{T}$) be a QSVNRTS is known as quadripartitioned single valued neutrosophic refined generalized pre closed set (QNRGPCS) if QNRPcl(ϱ) $\mathrel{\tilde{\subseteq}}$ L whenever $\varrho \mathrel{\tilde{\subseteq}}$ L and L is a QNROS in Λ^*.*

Definition 2.7 *[2] Let (Λ^*,$\mathfrak{T}$) be a QSVNRTS and ϱ ={⟨κ,$T_\varrho^J(\kappa), D_\varrho^J(\kappa), Y_\varrho^J(\kappa), F_\varrho^J(\kappa)$⟩:$\kappa \in \Lambda^*$} for J=1,2,...P be QSVNRS in X.Then quadripartitioned single valued neutrosophic refined generalized pre closure (QNRP($\mathfrak{cl}(\varrho)$) and quadripartitioned single valued neutrosophic refined generalized pre interior (QNRP$\mathfrak{int}(\varrho)$) are defined by*

QNRGP$\mathfrak{cl}(\varrho)$ = $\tilde{\cap}${K:K is a QNRGPCS in $\mathbb{X}$ and $\varrho \mathrel{\tilde{\subseteq}}$ K}

QNRGP$\mathfrak{int}(\varrho)$= $\tilde{\cup}${L:L is a QNRGPOS in $\mathbb{X}$ and L $\mathrel{\tilde{\subseteq}} \varrho$}

Definition 2.8 *[3] A map δ:(ω^*,Λ) → (κ^*,Γ) is known as Quadripartitioned single valued neutrosophic refined pre-continuous (QNRP conti) if $\delta^{-1}(\xi_{Q1}) \in$ QNRPCS(ω^*) for all QNRCS ξ_{Q1} of (κ^*,Γ).*

Definition 2.9 *[3] A map δ:(ω^*,Λ) → (κ^*,Γ) is known as Quadripartitioned single valued neutrosophic refined generalized pre-continuous (QNRGP conti) if $\delta^{-1}(\xi_{Q1})$ ∈ QNRGPCS(ω^*) for all QNRCS ξ_{Q1} of (κ^*,Γ).*

3. Quadripartitioned single valued neutrosophic refined generalized pre connected space

Definition 3.1 *A QSVNRTS ($\mathcal{X}$,τ) is said to be QSVNR C_5-connected space if the only QSVNRSs which are both QNROS and QNRCS are 0_{QNR} and 1_{QNR}.*

Definition 3.2 *A QSVNRTS ($\mathcal{X}$,τ) is said to be QSVNR generalized conncected(QSVNRG-connected)space if the only QSVNRSs which are both QNRGOS and QNRGCS are 0_{QNR} and 1_{QNR}.*

Definition 3.3 *A QSVNRTS ($\mathcal{X}$,τ) is said to be QSVNR generalized pre-conncected(QSVNRGP-connected) space if the only QSVNRSs which are both QNRGPOS and QNRGPCS are 0_{QNR} and 1_{QNR}.*

Example 3.4 *Let $\mathcal{X}$ = {e,f} andτ = {0_{QNR},1_{QNR}, U_1} is a QSVNRT on $\mathcal{X}$ where*

U_1={⟨ e,{0.4,0.5,0.6,0.7},{0.5,0.3,0.4,0.6},{0.2,0.4,0.5,0.4}⟩,

⟨ f,{0.3,0.4,0.7,0.6},{0.5,0.3,0.6,0.7}, {0.6,0.5,0.8,0.7}⟩}

Then ($\mathcal{X}$,τ) is QNRGP-connected space.

Theorem 3.5 *Every QSVNRGP-connected space is QSVNRC_5-connected but not conversely.*

Proof. Let ($\mathcal{X}$,τ) be QSVNRGP-connected space.Suppose ($\mathcal{X}$,τ) is not QSVNRC_5-connected space,then there exists a proper QSVNRS α which is both QNROS and QNRCS in ($\mathcal{X}$,τ).(i.e.,) α is both QNRGPOS and QNRGPCS in ($\mathcal{X}$,τ).This implies that ($\mathcal{X}$,τ) is not QSVNRGP-connected space.This is a contradiction.Therefore ($\mathcal{X}$,τ) is QSVNRC_5-connected space.

Example 3.6 *Let $\mathcal{X}$ = {e,f} andτ = {0_{QNR},1_{QNR}, U_1} is a QSVNRT on $\mathcal{X}$ where*

U_1={⟨ e,{0.3,0.5,0.6,0.4},{0.4,0.6,0.7,0.9},{0.3,0.2,0.5,0.6}⟩,

⟨ f,{0.4,0.6,0.7,0.9},{0.5,0.4,0.7,0.6}, {0.7,0.6,0.5,0.4}⟩}

Then ($\mathcal{X}$,τ) is $QNRC_5$-connected space but not QNRGP-connected,since the QSVNRS

α={⟨ e,{0.5,0.6,0.4,0.3},{0.5,0.7,0.4,0.6},{0.4,0.3,0.2,0.4}⟩,

⟨ f,{0.5,0.7,0.6,0.8},{0.3,0.5,0.6,0.4}, {0.8,0.7,0.4,0.2}⟩} in $\mathcal{X}$ is both QNRGPOS and QNRGPCS in $\mathcal{X}$.

Theorem 3.7 *Every QSVNRGP-connected space is QSVNRG-connected.*

Proof. Let ($\mathcal{X}$,τ) be QSVNRGP-connected space.Suppose ($\mathcal{X}$,τ) is not QSVNRG-connected space,then there exists a proper QSVNRS α which is both QNROS and QNRCS in ($\mathcal{X}$,τ).(i.e.,) α is both QNRGPOS and QNRGPCS in ($\mathcal{X}$,τ).This implies that ($\mathcal{X}$,τ) is not QSVNRGP-connected space.This is a contradiction.Therefore ($\mathcal{X}$,τ) is QSVNRG-connected space.

Theorem 3.8 *A QSVNRTS ($\mathcal{X}$,τ) is QSVNRGP-connected space if and only if there exists no non-zero QNRGPOSs α and β in ($\mathcal{X}$,τ) such that α = $\beta^{\tilde{c}}$.*

*Proof.***Necessity:** Let α and β be two QNRGPOSs in ($\mathcal{X}$,τ) such that $\alpha \neq 0_{QNR} \neq \beta$ and $\alpha = \beta^{\tilde{c}}$.Since $\alpha = \beta^{\tilde{c}}$,$\beta$ is QNRGPOS which implies that $\beta^{\tilde{c}} = \alpha$ is QNRGPCS.since $\beta \neq 0_{QNR}$ this implies that $\beta^{\tilde{c}} \neq 1_{QNR}$ (i.e.,)$\alpha \neq 1_{QNR}$.Hence there exists a proper QSVNRS α ($\alpha \neq 0_{QNR}$, $\alpha \neq 1_{QNR}$) which is both QNRGPOS and QNRGPCS in ($\mathcal{X}$,τ).Hence ($\mathcal{X}$,τ) is not QSVNRGP-connected space.But it is contradiction to our hypothesis.Thus there exists no non-zero QNRGPOSs α and β in ($\mathcal{X}$,τ) such that $\alpha = \beta^{\tilde{c}}$.

Sufficiency: Let ($\mathcal{X}$,τ) be QSVNRTS and α is both QNRGPOS and QNRGPCS in ($\mathcal{X}$,τ) such that $0_{QNR} \neq \alpha \neq 1_{QNR}$.Now let $\beta = \alpha^{\tilde{c}}$.In this case,$\beta$ is QNRGPOS and $\alpha \neq 1_{QNR}$ this implies that $\beta = \alpha^{\tilde{c}} \neq 0_{QNR}$. Hence

$\beta \neq 0_{QNR}$ which is a contradiction to our hypothesis.Therefore there is a proper QSVNRS of $(\mathcal{X},\tau)$ which is both QNRGPOS and QNRGPCS in $(\mathcal{X},\tau)$.Hence $(\mathcal{X},\tau)$ is QNRGP-connected space.

Theorem 3.9 *A QSVNRTS $(\mathcal{X},\tau)$ is QSVNRGP-connected space if and only if there exists no non-zero QNRGPOSs α and β in $(\mathcal{X},\tau)$ such that $\alpha = \beta^{\tilde{c}}$, β = (QNRGPcl(α))$^{\tilde{c}}$ and α = (QNRGPcl(β))$^{\tilde{c}}$.*

*Proof.***Necessity:**Assume that there exists QSVNRSs α and β in $(\mathcal{X},\tau)$ such that $\alpha \neq 0_{QNR} \neq \beta$,$\beta = \alpha^{\tilde{c}}$,$\beta$ = (QNRGPcl(α))$^{\tilde{c}}$ and α = (QNRGPcl(β))$^{\tilde{c}}$.since (QNRGPcl(α))$^{\tilde{c}}$ and (QNRGPcl(β))$^{\tilde{c}}$ are QNRGPOSs in $(\mathcal{X},\tau)$,α and β are QNRGPOSs in $(\mathcal{X},\tau)$.This implies $(\mathcal{X},\tau)$ is not QNRGP-connected space,which is a contradiction to our hypothesis.Therefore there exists no non-zero QNRGPOSs α and β in $(\mathcal{X},\tau)$ such that $\alpha = \beta^{\tilde{c}}$, β = (QNRGPcl(α))$^{\tilde{c}}$ and α = (QNRGPcl(β))$^{\tilde{c}}$.

Sufficiency: Let α be both QNRGPOS and QNRGPCS in $(\mathcal{X},\tau)$ such that $1_{QNR} \neq \alpha \neq 0_{QNR}$.Now by taking $\beta = \alpha^{\tilde{c}}$ we obtain a contradictory to our hypothesis.Hence $(\mathcal{X},\tau)$ is QNRGP-connected space.

Theorem 3.10 *Let ($\mathcal{X}$,□) be QSVNR □□□$_{1/2}$ space.Then the following conditions are equivalent.*

a)(□,□) is QNRGP-connected space.

b)(□,□) is QNRG-connected space.

c)(□,□) is QNR□$_5$-connected space.

Proof. a) → b) It is obvious from the theorem 3.7.

b) → c) It is obvious.

c) → a) Let (□,□) be QNR□$_5$-connected space.Suppose (□,□) is not QNRGP-connected space,then there exists a proper QSVNRS □ in (□,□) which is both QNRGPOS and QNRGPCS in (□,□).But since (□,□) is QSVNR □□□$_{1/2}$,□ is both QNROS and QNRCS in (□,□).This implies that (□,□) is not QNR□$_5$-connected space,which is a contradiction to our hypothesis.Therefore (□,□) must be QNRGP-connected space.

Theorem 3.11 *If f:(□,□) → (□,□)is QNRGP continuous mapping and (□,□) is QNRGP-connected space then (□,□) be QNR□$_5$-connected space.*

Proof. Let (□,□) be QNRGP-connected space.Suppose (□,Ω) is not QNR□$_5$-connected space,then there exists a proper QSVNRS □ which is both QNROS and QNRCS in (□,Ω).Since f is QNRGP continuous mapping,□$^{-1}$(□) is a proper QSVNRS of (□,□) which is both QNRGPOS and QNRGCS in (□,□).But this is a contradiction to our hypothesis.Hence (□,Ω) is QNR□$_5$-connected space.

Theorem 3.12 *If f:(□,□) → (□,□)is QNRGP irresolute mapping and (□,□) is QNRGP-connected space then (□,□) is also a QNRGP-connected space.*

Proof. Let (□,□) be QNRGP-connected space.Suppose (□,Ω) is not QNRGP-connected space,then there exists a proper QSVNRS □ which is both QNROS and QNRCS in (□,Ω).Since f is QNRGP irresolute mapping,□$^{-1}$(□) is a proper QSVNRS of (□,□) which is both QNRGPOS and QNRGCS in (□,□).But this is a contradiction to .Hence (□,Ω) is QNRGP-connected space.

Definition 3.13 *Two QSVNRSS □ and □ in (□,□) are said to be q-coincident(□q□)iff there exists an element x∈ □ such that □$^□_□$(x) >(□$^□_□$)$^□$(x),□$^□_□$(x) >(□$^□_□$)$^□$(x),□$^□_□$(x) <(□$^□_□$)$^□$(x) and □$^□_□$(x) <(□$^□_□$)$^□$(x)*

Definition 3.14 *Two QSVNRSs □ and □ in (□,□) are said to be q-coincident(□q□) iff □ ⊆̃ □$^□$*

Definition 3.15 *A QSVNRTS (□,□) is called QNR□$_5$-connected between two QSVNRSs □ and □ if there is no QNROS □ in (□,□) such that □ ⊆̃ □ and □□$^□$□*

Definition 3.16 *A QSVNRTS (□,□) is called QNRGP-connected between two QSVNRSs □ and □ if there is no QNRGPOS □ in (□,□) such that □ ⊆̃ □ and □□$^□$□*

Example 3.17 *Let □ = {e,f} and□ = {0$_{□□□}$,1$_{□□□}$, □$_1$} is a QSVNRT on □ where*

□$_1$={⟨ e,{0.3,0.6,0.5,0.4},{0.5,0.3,0.2,0.6},{0.4,0.4,0.3,0.4}⟩,

⟨ f,{0.3,0.5,0.4,0.3},{0.4,0.3,0.3,0.4}, {0.3,0.6,0.4,0.3}⟩}

Then (□,□) is QNRGP-connected space between two QSVNRs

□={⟨ e,{0.2,0.4,0.6,0.5},{0.4,0.6,0.5,0.7},{0.5,0.2,0.5,0.4}⟩,

⟨ f,{0.2,0.3,0.5,0.7},{0.3,0.2,0.4,0.5}, {0.2,0.3,0.7,0.4}⟩} and

□={⟨ e,{0.1,0.5,0.7,0.6},{0.3,0.5,0.4,0.8},{0.7,0.3,0.6,0.5}⟩,

⟨ f,{0.2,0.3,0.6,0.5},{0.2,0.5,0.3,0.4}, {0.3,0.5,0.6,0.7}⟩}

Theorem 3.18 *If a QSVNRTS (□,□) is QNRGP-connected between two QSVNRSs □ and □,then it is QNR□$_5$-connected between two QSVNRSs □ and □ but the converse may not be true in general.*

Proof. Suppose (□,□) is not QNR□$_5$-connected between □ and □,then there exists a QNROS □ in (□,□) such that □ ⊆ □ and □□$^□$□.since every QNROS is QNRGPOS there exists a QNRGPOS □ in (□,□) such that □ ⊆ □ and □□$^□$□.This implies (□,□) is not QNRGP connected between □ and □,a contradiction to hypothesis.Therefore (□,□) is QNR□$_5$-connected between □ and □.

Example 3.19 *Let □ = {e,f} and□ = {0$_{□□□}$,1$_{□□□}$, □$_1$} is a QSVNRT on □ where*

□$_1$={⟨ e,{0.6,0.3,0.5,0.4},{0.7,0.8,0.2,0.3},{0.5,0.4,0.6,0.3}⟩,

⟨ f,{0.9,0.8,0.5,0.6},{0.6,0.5,0.8,0.7}, {0.7,0.8,0.5,0.6}⟩}

Then (□,□) is QNRGP-connected space between the QSVNRs V and W.

□={⟨ e,{0.5,0.4,0.6,0.3},{0.6,0.7,0.4,0.3},{0.6,0.5,0.4,0.7}⟩,

⟨ f,{0.3,0.4,0.4,0.5},{0.5,0.4,0.6,0.7}, {0.4,0.3,0.4,0.5}⟩} and

□={⟨ e,{0.2,0.3,0.7,0.6},{0.2,0.3,0.9,0.8},{0.4,0.2,0.7,0.8}⟩,

⟨ f,{0.3,0.2,0.7,0.4},{0.3,0.4,0.8,0.7}, {0.3,0.2,0.6,0.7}⟩}

But (□,□) is not QNRGP-connected between □ and □ since the QSVNRS

□={⟨ e,{0.6,0.5,0.4,0.2},{0.7,0.8,0.3,0.2},{0.7,0.6,0.3,0.5}⟩,

⟨ f,{0.4,0.6,0.3,0.4},{0.6,0.7,0.5,0.4}, {0.5,0.5,0.3,0.4}⟩} is QNRGPOS such that □ ⊆ □

4 Conclusion

We have discussed about the □ □ □□$_5$-connected space,QNRG-connected space and QNRGP-connected space as well as their characterizations of connectedness in these spaces.

Refrences

[1] Atanasov K.T, Intuitionistic Fuzzy Sets, Fuzzy Sets and Systems.20 (1986),87-96.

[2] Arokia pratheesha S.V, Mohana.K," Quadripartitioned Single Valued Neutrosophic Refined Sets and Its Topological Spaces,"International journal of creative research thoughts(IJCRT),Vol 10, Issue 3 (Mar 2022), pp-d937-d948

[3] Arokia pratheesha S.V, Mohana.K,"Generalized pre continuous mappings in Quadripartitioned Single Valued Neutrosophic Refined topological spaces(Communicated).

[4] S. Broumi, F. Smarandache, "Several Similarity Measures of Neutrosophic Sets," NSS, 1 pp. 54- 62, 2013.

[5] S. Broumi, I. Deli and F. Smarandache, "Distance and Similarity Measures of Interval Neutrosophic Soft Sets," Critical Review, Center for Mathematics of Uncertainty, Creighton University,USA,8 pp.14–31, 2014.

[6] I.Deli and S.Broumi,Neutrosophic multisets and its application in medical diagnosis(20)

[7] M.Hanafy, A. A. Salama and K. Mahfouz, "Correlation of Neutrosophic Data," International Refereed Journal of Engineering and Science, 1(2), pp.39- 43, 2012.

[8] M.Hanafy, A. A. Salama and K. Mahfouz, "Correlation coefficients of neutrosophic sets by centroid Method," International Journal of Probability and Statistics, 2(1), pp.9-12, 2013.

[9] P. Rajarajeswari and N. Uma," On Distance and Similarity Measures of Intuitionistic Fuzzy Multi Set," IOSR Journal of Mathematics, 5(4), pp.19- 23, 2013

[10] F.Smarandache, A unifying Field in Logics.Neutrosophy: Neutrosophic Probability,Set and Logic,Rehoboth:American Research press (1998).

[11] F.Smarandache,n-valued Refined Neutrosophic Logic and its Applications in Physics,Progress in Physics,143-146,Vol.4,2013.

[12] Wang H, Smarandache F, Zhang YQ, Sunderraman R, Single valued neutrosophicsets, MultispaceMultistruct4.,(2010),410-413.

[13] Ye,J.Ye, Dice similarity measure between single valued neutrosophic multisets and its application in medical diagnosis,Neutrosophic Sets and Systems 6(2014) 48-52.

[14] J.Ye,"Similarity Measure between Interval Neutrosophic Sets and Their Applications in Multiciteria Decision Making," Journal of intelligent and fuzzy systems 26, pp-165-172, 2014

[15] J.Ye,"Multicriteria Decision-Making Method using the Correlation Coefficient under SingleValued Neutrosophic Environment," International Journal of General Systems, 42(4), pp.386- 394, 2013

[16] L.A. Zadeh, Fuzzy Sets, Inform and Control,8(1965) 338-353.